

phosphorus indicate that the carbon groups contained in codeia are in an eminently "unsaturated" condition, being capable of taking up several molecules of HI and of H_2O , forming compounds not decomposed at 100° , 2 equivalents of hydrogen for every C_{17} being also added on in every case.

III. "On a Periodic Change of the Elements of the Force of Terrestrial Magnetism discovered by Professor HORNSTEIN." Communicated by the Foreign Secretary. Received July 22, 1871.

[From the *Anzeiger der k. Akademie der Wissenschaften* in Wien for June 15, 1871.]

Professor Hornstein, of Prague, has communicated to the Imperial Academy of Sciences of Vienna a paper entitled "On the dependence of the Earth's Magnetism on the Rotation of the Sun."

He shows that the changes of each of the three elements of the force of terrestrial magnetism (declination, inclination, and horizontal force) indicate a period of $26\frac{1}{3}$ days. The periodic change of declination for Prague (1870) amounts to $0.705 \sin(x + 190^\circ 20')$, where $x = 0^\circ$ at the commencement of 1870, and $x = 360^\circ$ at the commencement of 1871. For Vienna the range is a little larger. The range of inclination is nearly one-third of that of declination, that of the intensity nearly 24 units of the 4th decimal (the intensity in June 1870 was nearly 2.0485).

Professor Hornstein regards these changes of the earth's magnetism as the effect of the sun's rotation, and by a mean of several determinations finds for the duration of the period 26.33 days. This number may consequently be regarded as the result of the first attempt to determine the synodic period of the sun's rotation by means of the magnetic needle. The resulting true periodic time of the sun's rotation is 24.55 days, almost exactly agreeing with the time of rotation of the sun-spots in the sun's equator deduced from astronomical observations (according to Spörer 24.541 days).

IV. "Corrections to the Computed Lengths of Waves of Light published in the Philosophical Transactions of the year 1868." By GEORGE BIDDELL AIRY, C.B., Astronomer Royal. Received October 2, 1871.

(Abstract.)

The author, after adverting to the process by which in a former paper he had attempted the computation of the Lengths of Waves of Light, for the entire series measured in the Solar Spectrum by Kirchhoff, from a limited number of measured Wave-Lengths, and to the discordances between the results of these computations and the actual measure of numerous wave-lengths to which he subsequently had access, calls attention to his remark that means existed for giving accuracy to the whole. The object of the present paper is so to use these means as to produce a table of corrections

applicable through the entire range of Kirchhoff's lines, and actually to apply the corrections to those computed wave-lengths which relate to spectral lines produced by the atmosphere and by many metals.

Adopting as foundation the comparisons with Ångström's and Ditscheiner's measures given in the former paper, and laying these down graphically, the author remarks that in some parts of the spectrum the agreement of the two experimenters is very close, that in some parts they are irreconcilable, and that in one part (where they agree) there is a peculiarity which leads to the supposition that some important change was made in Kirchhoff's adjustments. He then explains the considerations on which he has drawn a correction-curve, whose ordinates are to give the corrections applicable to his former computed numbers. A general table of corrections is then given, and this is followed by tables of the Lengths of the Light-Waves for the air and metals as corrected by the quantities deduced from that general table.

The author remarks that he has not yet succeeded in discovering any relation among the wave-lengths for the various lines given by any one metal &c. which can suggest any mechanical explanation of their origin.

V. "Corrections and Additions to the Memoir on the Theory of Reciprocal Surfaces, Phil. Trans. vol. clix. (1869)." By Prof. CAYLEY, F.R.S. Received July 22, 1871.

1. I am indebted to Dr. Zeuthen for the remark that although the "off-points" and "off-planes," as explained in the memoir, are real singularities, they are not the singularities to which the θ , θ' of the formulæ refer. The most convenient way of correcting this is to retain all the formulæ with θ , θ' as they stand, but to write ω , ω' for the number of "off-points" and "off-planes" respectively; viz. we thus have

ω , off-points,
 θ , unexplained singular points,

and

ω' , off-planes,
 θ' , unexplained singular planes,

the formulæ as they stand, taking account of the unexplained singularities θ and θ' , but not taking any account at all of the off-points and off-planes ω , ω' . The extended formulæ in which these are taken into account are:—

$$a(n-2) = \kappa - B + \rho + 2\sigma + 3\omega,$$

$$b(n-2) = \rho + 2\beta + 3\gamma + 3t,$$

$$c(n-2) = 2\sigma + 4\beta + \gamma + \theta + \omega,$$

$$a(n-2)(n-3) = 2(\delta - C - 3\omega) + 3(ac - 3\sigma - \chi - 3\omega) + 2(ab - 2\rho - j),$$

$$b(n-2)(n-3) = 4k + (ab - 2\rho - j) + 3(bc - 3\beta - 2\gamma - i),$$

$$c(n-2)(n-3) = 6h + (ac - 3\sigma - \chi - 3\omega) + 2(bc - 3\beta - 2\gamma - i),$$

which replace Salmon's original formulæ (A) and (B).